



## CERTIFICATE OF TRANSLATION

I, Nora Wu, of TOP TEAM INTERNATIONAL PATENT & TRADEMARK OFFICE located at 3<sup>rd</sup> Fl., No. 279, Sec. 4, Hsin-Yi Rd., Taipei, Taiwan, R.O.C, hereby declare that I am the translator of the attached Taiwan priority document no. 92112395, filed on May 7, 2003, and certify that the following is a true translation of the document to the best of my knowledge and belief.

Signature of Translator

A handwritten signature in cursive script, appearing to read "Nora Wu", written over a horizontal line.

Nora Wu

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**TITLE**

**HOUSING STRUCTURE**

**ABSTRACT OF THE DISCLOSURE**

A housing structure. The housing structure includes  
5 a first case and a second case. The first case includes  
a first inner wall, at least one first connecting  
portion, and at least one first thrust portion. The  
second case includes a second inner wall, at least one  
second connecting portion, and at least one second thrust  
10 portion. Each of the second thrust portions further  
includes a notch. When the first case is joined with the  
second case, the second thrust portion engages the notch.  
In addition, the first case and the second case have  
uniform appearances.

**THE REPRESENTATIVE FIGURE IS FIG. 6A**

**THE DESCRIPTION OF THE REFERENCE NUMBER IN THE  
REPRESENTATIVE FIGURE**

10~ first wall  
20 100~ end surface  
101~ bottom surface  
10S1、10S2~ first outer wall, first inner wall  
11~ first connecting portions  
12~ first thrust portion  
25 121、122~ end portions  
121E、122E~ end portion

2~ second case

20~ second wall

20-1~ main panel

20-2~ wing panel

5 20S1、20S2~ second outer wall, second inner wall

21~ second connecting portions

210~ positioning plate

22~ second thrust portion

50~ notches

10 L1~ joint region

P1~ housing structure

## **BACKGROUND OF THE INVENTION**

### **Field of the Invention**

15 The invention relates to a housing structure; in particular, the invention relates to a housing structure with a uniform appearance, and without separation subjected to a force.

20 Fig. 1 is a schematic view of a conventional housing structure B (B1, B2, and B3). The housing structure B includes a lower case H1 and an upper case H2. A space is formed between the lower case H1 and the upper case H2 when they are joined. An object E, such as a hard disc drive, an optical disc drive, or the other electronic  
25 device, is received in the space of the housing structure B. A joint region J is formed at a contact point between the lower case H1 and the upper case H2 subsequent to their assembly.

The following descriptions are three kinds of conventional housing structures B1, B2, B3 based on the housing structure B in Fig. 1.

Referring to Figs. 2A-2C, Fig. 2A is a partial perspective view of the housing structure B, and is cut away along a line T1-T2 of Fig. 1 for showing the first conventional housing structure B1. Fig. 2B is a partial side view of Fig. 2A, and Fig. 2C is a cross-sectional view along a line X-X of Fig. 2B.

In Fig. 2A, the lower case H1 includes a side wall W1-1 and at least one positioning protrusions C-1. The positioning protrusions C-1 are separately disposed on an inner wall of the side wall W1-1, and are separate from each other. The upper case H2 includes a side wall W1-2 and at least one positioning plates C-2. The positioning plates C-2 are disposed on an inner wall of the side wall W1-2, and are separate from each other. A positioning hole C-3 is formed in each positioning plate C-2.

When the positioning protrusions C-1 of the lower case H1 are inserted into the positioning holes C-3 of the positioning plates C-2 of the upper case H2, the assembly of the lower case H1 and the upper case H2 is complete. The housing structure B1 is divided into an inner space IS and an outer space OS by the side walls W1-1 of the lower case H1, and W1-2 of the upper case H2. The object E as shown in Fig. 1 is received in the inner space IS.

Fig. 2B shows a slit J11 presented at the joint region J1 between the side walls W1-2, W1-2. Structures

inside the housing structure B1 can be seen from the joint region J1, which is not an ideal structure.

Fig. 2D is a schematic view of the housing structure based on 2C and a force F exerted thereon. When the upper case H2 is subject to the force F, the positioning plate C-2 is partially separated from the positioning protrusion C-1. Thus, the upper case H2 may accidentally be separated from the lower case H1.

Referring to Fig. 3A and Fig. 3B, Fig. 3A is a partial perspective view of the housing structure B, and is cut away along a line T1-T2 of Fig. 1 for showing the second conventional structure B2. Fig. 3B is a partial side view of Fig. 3A.

In Fig. 3A, the housing structure B2 includes two side walls W2-1, W2-2 contacting each other. The side wall W2-1 is formed with a step portion M21 at its free end, and the side wall W2-2 is formed with a step portion M22 at its free end. The step portion M21 contacts the step portion M22. A joint region J2 is formed between the side walls W2-1, W2-2.

The housing structure B2 differs from the housing structure B1 (The free ends of the two side walls W2-1, W2-2 of the housing structure B1 are formed with flat portions M11, M12) in that the side walls W2-1, W2-2 are engaged by the step portions M21, M22. Since other components, such as positioning protrusions C-1 and positioning plates C-2, of housing structure B2 are the same as those of the housing structure B1, their description is omitted.

Referring to Fig. 3C and Fig. 3D, Fig. 3C is a cross-sectional view along a line Y-Y of Fig. 3B. Fig. 3D is a schematic view of the housing structure B2 being subjected to a force F.

5 As shown in Fig. 3D, since the side walls W2-1, W2-2 of the housing structure B2 are assembled by engaging the step portions M21, M22, the structure in the inner space IS of the housing structure B2 cannot be seen via the joint region J2 from the outer space OS. When the side  
10 wall W2-2 is subjected to the force F, the side wall W2-2 cannot be effectively stopped by the step portion M21 of the side wall W2-1. Thus, the positioning plate C-2 is partially separated from the positioning protrusion C-1, and the side wall W2-2 may be accidentally separated from  
15 the side wall W2-2.

Furthermore, since the step portion M21 of the side wall W2-1 is provided with a non-uniform cross section, a non-uniform appearance K is formed on the outer surface during injection molding as shown in Fig. 3E.  
20 Specifically, when the thickness of the product changes abruptly, as shown in Fig. 3F, the non-uniform appearance K is easily formed on the back side of the position where the abrupt change occurred. Thus, the appearance of the product suffers.

25 Referring to Fig. 4A and Fig. 4B, Fig. 4A is a partial perspective view of the housing structure B3, and is cut away along a line T1-T2 of Fig. 1 for showing the third conventional structure B3. Fig. 4B is a partial side view of Fig. 4A.

In Fig. 4A, the housing structure B3 includes two side walls W3-2, W3-2 contacting each other. The side wall W3-1 is formed with a step portion M31 at its free end, and the side wall W3-2 is formed with a step portion M32 at its free end. The step portion M31 contacts the step portion M32. A joint region J3 is formed between the side walls W3-2, W3-2.

The housing structure B3 differs from the housing structure B2 (with step portions M21, M22) in that the geometric structure of the combination of the step portions M31, M32 is completely reversed from that of the step portions M21, M22. Since the other components, such as the positioning protrusions C-1 and the positioning plates C-2, of the housing structure B3 are the same as those of the housing structure B1, their description is omitted.

Referring to Fig. 4C and Fig. 4D, Fig. 4C is a cross-sectional view along a line Z-Z of Fig. 4B. Fig. 4D is a schematic view of the housing structure in Fig. 4C at where the non-uniform appearance K may possibly appear.

As shown in Fig. 4C, since the side walls W3-1, W3-2 of the housing structure B3 are assembled by engaging the step portions M31, M32, the structure in the inner space IS of the housing structure B3 cannot be seen via the joint region J3 from the outer space OS. Additionally, the side wall W3-2 cannot be accidentally separated from the side wall W3-1 due to external force exerted by the engagement of the step portions M31, M32, and the

engagement of the positioning protrusions C-1 and the positioning plates C-2.

However, since the step portion M32 of the side wall W3-2 is provided with a non-uniform cross section, a non-uniform appearance K is formed on the outer surface during injection molding as shown in Fig. 4D. Thus, the appearance of the product suffers.

### SUMMARY

In order to address the disadvantages of the aforementioned housing structure, the invention provides a housing structure with a uniform appearance.

Accordingly, the invention provides a housing structure including a first case and a second case. The first case includes a first inner wall with an extension plate. The length of the extension plate is  $h$ . The second case includes a second inner wall with at least a rib. A notch is defined between the rib and the second inner wall, and the depth of the notch is  $h$ . When the first case is joined with the second case, the extension plate engages the notch to thrust each other. Thus, the first case is not separated from the second case.

Alternatively, the housing structure includes a first case and a second case. The first case includes a first inner wall with a Z-shaped end surface. An extension plate is formed on the Z-shaped end surface, and the length of the extension plate is  $h$ . The second case includes a second inner wall with at least a rib. A notch is defined between the rib and the second inner wall, and the depth of the notch is  $h$ . When the first



case is joined with the second case, the extension plate engages the notch to thrust each other. Thus, the first case is not separated from the second case.

5 In order to achieve the above objective, the invention provides a housing structure. When a first wall of the housing structure is subjected to an external force, a thrust portion of the second case, the jointed first connecting portion and second connecting portion prevent the first wall from being moved toward an inner  
10 space of the housing structure. Thus, the first case would not be separated from the second case.

When a second wall of the housing structure is subjected to an external force, two ends of a first thrust portion of the first case, the jointed first  
15 connecting portion and second connecting portion prevent the second wall from being moved toward to an inner space of the housing structure. Thus, the first case would not be separated from the second case.

20 The first wall and the second wall are substantially uniform, such that during the injection molding process, the first wall and the second wall do not form uniform appearances on their outer surface.

## **DETAILED DESCRIPTION OF THE INVENTION**

### **First Embodiment**

25 Referring to Fig. 5, Fig. 5 is a perspective view of a housing structure P1. The housing structure P1 receives an object E, such as a hard disc drive, an

optical disc drive, or another electronic device, therein.

The housing structure P1 includes a first case 1 and a second case 2. A space is formed between the first case 1 and the second case 2. A joint region L1 is formed at a contact point between the first case 1 and the second case 2 after assembly. I and II represent imaginary surfaces. A sectional view from I to II are cut to show a partial sectional view of the housing structure P1, and Figs. 6A to 6E are descriptive to the sectional view.

Referring to Figs. 6A and 6B, Fig. 6A is a partial perspective view of the housing structure P1, and is cut away along a line I-II of Fig. 5. Fig. 6B is an exploded view of Fig. 6A, and Fig. 6C is a partially enlarged view of Fig. 6A.

As shown in Fig. 6B, the first case 1 includes a first wall 10 (hook), at least one first connecting portion 11, and at least one first thrust portion 12 (rib). The first wall 10 includes a first outer wall 10S1 and a first inner wall 10S2, and is provided with a uniform cross section. The first wall 10 includes an end surface 100 facing the second case 2. The first connecting portions 11 and the first thrust portions 12 are disposed on the first inner wall 10S2 of the first wall 10, and are separate from each other.

In this embodiment, the first connecting portions 11 and the first thrust portions 12 are integrally formed on the first wall 10. The first connecting portions 11 comprise two stop plates 121, 122, wherein the two stop

plates 121, 122 are protrusions correspondingly parallel to each other. The first connecting portions 11 are disposed between the stop plates 121, 122.

The second case 2 includes a second wall 20, at least one second connecting portions 21, and at least one second thrust portion 22. The second wall 20 includes a main panel 20-1 and a wing panel 20-2 having second outer wall 20S1 and a second inner wall 20S2, and is provided with a uniform cross section. The second wall 20 includes an end surface 200 facing the first case 1. The second connecting portions 21 are separately disposed on the second inner wall 20S2 of the first second wall 20, and are separate from each other. The second thrust portion 22 are extension plates extending from the end surface 200 of the second wall 200.

In this embodiment, each second connecting portions 21 includes a positioning plate 210 and a hole 211 formed on the positioning plate 210. The second thrust portion 22 is a plate-like protrusion formed continuously over the end surface 200 of the second wall 20. The second connecting portions 21 and the second thrust portion 22 are integrally formed on the second wall 20.

To join the first case 1 and the second case 2, the positioning plate 210 of the second case 2 is firstly guided into the space between the first thrust portion 12 (between two parallel stop plates 121, 122) of the first case 1. When the end surface 200 of the second case 200 is abutted by the end surface 100 of the first case 1, the second connecting portions 21 are engaged with the first connecting portions 11 so that the assembly of the

housing structure P1 is complete. That is, when the first connecting portions 11 are joined with the second connecting portions 21, the second thrust portion 22 is adjacent to the first inner wall 10S2.

5 Fig. 6C is a partial enlarged view, the length of the second thrust portion 22 is h, and is extended from the end surface 200 and the second inner wall 20S2. Notches 50 are formed between the stop plate 121E, 122E and the first inner wall 10S2, and the depth of the notch  
10 50 is h. When the first case 1 is joined with the second case 2, the second thrust portion 22 is positioned in the notches 50. Thus, the second thrust portion 22 contacts the notches 50, and does not move as a result of deposition. That is, the force F as shown in Fig. 6D is  
15 offset.

Referring to Fig. 6D and Fig. 6E, Fig. 6D is a partial side view of Fig. 6A, and Fig. 6E is a cross-sectional view along a line A-A of Fig. 6D.

In Fig. 6E, subsequent to assembly of the housing  
20 structure P1, the end surface 200 of the second case 2 is abutted by the end surface 100 of the first case 1. The housing structure P1 is divided into the inner space IS and the outer space OS by the first wall 10 of the first case 1 and the second wall 20 of the second case 2. The  
25 object E as shown in Fig. 5 is received in the inner space IS.

Due to the deposition of the second thrust portion 22 of the first case 2, the structure inside the housing structure P1 cannot be seen from the joint region L1 (as  
30 shown in Fig. 5). In addition, when the first wall 10 of

the first case 1 is subject to an external force  $F$ , the first wall 10 cannot be moved toward the inner space IS by the first connecting portions 11, and the second connecting portions 21, and the second thrust portion 22 of the second case 2. Thus, the second case 1 cannot be accidentally separated from the first case 2. When the second wall 20 of the second case 2 is subjected to the external force  $F'$ , the second wall 20 cannot be moved toward the inner space IS by the first connecting portions 11, and the second connecting portions 21, and the end portions 121E, 122E of the first thrust portion 12.

In addition, as shown in Fig. 6E, each first wall 10 and second wall 20 are substantially provided with a uniform cross section respectively. The second thrust portion 22 is a protrusion formed on the end surface 200 near the second inner wall 20S2. Thus, during injection molding, an outer surface 10S1 of the first wall 10 does not present a non-uniform appearance thereon. Also, an outer surface 20S2 of the second wall 20 does not present a non-uniform appearance thereon.

### **Second embodiment**

Fig. 7 is a perspective view of a housing structure P2 as disclosed in a second embodiment of the invention. The housing structure P2 includes a first case 2' and a second case 1, and receives the object E therein.

The second case 2' of the housing structure P2 is different from that of the first embodiment. The first

case 1 of the housing structure P2 is the same as that of the housing structure P1, its description is omitted.

Referring to Figs. 8A and 8B, Fig. 8A is a partial perspective view of the housing structure P2 in Fig. 7, and is cut away along a line III- IV of Fig. 7. Fig. 8B is an exploded view of Fig. 8A;

In Fig. 8B, the second case 2' includes a second wall 20', at least one second connecting portions 21' and an second thrust portion 22'. The second wall 20' includes a main plate 20'-1, a first wing plate 20'-2 and a second wing plate 20'-3, and is provided with a first inner wall 20'S1 and a first outer wall 20'S2 with a uniform cross section. The main plate 20'-1 is formed on the end with the relatively thin first wing plate 20'-2, and the first wing plate 20'-2 and the second wing plate 20'-3 are extended perpendicular from the main plate 20'-1 in a longitudinal direction. (That is, the main plate 20'-1, the first wing plate 20'-2, and the second wing plate 20'-3 form a structure with an U-shaped section. The main plate 20'-1 and the first wing plate 20'-2 form a structure with a Z-shaped section. The main plate 20'-1 and the second wing plate 20'-2 form a structure with an L-shaped section.) The second wall 20' includes an end surface 200' facing the first case 1. The second thrust portion 22 is formed on the end surface 20'-2. The second connecting portions 21' are separately disposed on the second inner wall 20'S2 of the second wall 20' corresponding to the first connecting portions 11 of the first case 1, and are separate from each other.

Referring to Figs. 8C and 8D, Fig. 8C is a partial side view of Fig. 8A, and Fig. 8D is a cross-sectional view along a line B-B of Fig. 8C.

In Fig. 8D, after the assembly of the housing structure P2, the end surface 20'-2 of the second case 2' is abutted by the end surface 100 of the first case 1. The housing structure P2 is divided into the inner space IS and the outer space OS by the first wall 10 of the first case 1 and the second wall 20' of the second case 2'.

Due to the deposition of the second thrust portion 22' of the second case 2', the structure inside the housing structure P2 cannot be seen from the joint region L2 (as shown in Fig. 7). In addition, when the first wall 10 of the first case 1 is subjected to an external force F, the first wall 10 cannot be moved toward the inner space IS by the first connecting portions 11, and the second connecting portions 21', and the second thrust portion 22' of the second case 2'. Thus, the first case 1 cannot be accidentally separated from the second case 2'. When the second wall 20' of the second case 2' is subjected to the external force F', the second wall 20' cannot be moved toward the inner space IS by the first connecting portions 11, the second connecting portions 21', and the end portions 121E, 122E of the first thrust portion 12.

As shown in Fig. 8D, the second wall 20' is substantially provided with an U-shaped uniform cross section. The second thrust portion 22' is an extension plate or a protrusion formed on the end surface 200 near

the second inner surface 20S2. Thus, during injection molding, an outer surface 10S1 of the first wall 10 does not present a non-uniform appearance. Also, an outer surface 20S1 of the second wall 20 does not present a non-uniform appearance.

While the invention has been described by way of example and in terms of the preferred embodiments, it is to be understood that the invention is not limited to the disclosed embodiments. To the contrary, it is intended to cover various modifications and similar arrangements (as would be apparent to those skilled in the art). Therefore, the scope of the appended claims should be accorded the broadest interpretation so as to encompass all such modifications and similar arrangements.

#### DESCRIPTION OF THE DRAWINGS

Fig. 1 a perspective view of a conventional housing structure;

Fig. 2A is a partial perspective view of a conventional housing structure, and is cut away along a line T1-T1 of Fig. 1 for showing a first conventional housing structure B1;

Fig. 2B is a partial side view of Fig. 2A;

Fig. 2C is a cross-sectional view along a line X-X of Fig. 2B;

Fig. 2D is a schematic view of the housing structure in Fig. 2D being subjected to a force;

Fig. 3A is a partial perspective view of another conventional housing structure, and is cut away along a



line T1-T1 of Fig. 1 for showing a second conventional structure B2;

Fig. 3B is a partial side view of Fig. 3A;

Fig. 3C and Fig. 3E are cross-sectional views along  
5 a line Y-Y of Fig. 3B;

Fig. 3D is a schematic view of the housing structure in Fig. 3A being subjected to a force;

Fig. 3F is a schematic view of a product with a non-uniform appearance after injection molding;

10 Fig. 4A is a partial perspective view of another conventional housing structure, and is cut away along a line T1-T1 of Fig. 1 for showing a third conventional structure B3;

Fig. 4B is a partial side view of Fig. 4A;

15 Fig. 4C is cross-sectional views along a line Z-Z of Fig. 4B;

Fig. 4D is a schematic view of the housing structure of Fig. 4C at where the non-uniform appearance may possibly appear;

20 Fig. 5 is a perspective view of a housing structure as disclosed in a first embodiment of the invention;

Fig. 6A is a partial perspective view of the housing structure in Fig. 5, and is cut away along a line I-I of Fig. 5;

25 Fig. 6B is an exploded view of Fig. 6A;

Fig. 6C is a partial enlarged view of a region R1 in Fig. 6B;

Fig. 6D is a partial side view of Fig. 6A;

30 Fig. 6E is a cross-sectional view along a line A-A of Fig. 6D;

Fig. 7 is a perspective view of a housing structure P2 as disclosed in a second embodiment of the invention;

Fig. 8A is a partial perspective view of the housing structure in Fig. 7, and is cut away along a line III-III of Fig. 7;

Fig. 8B is an exploded view of Fig. 8A;

Fig. 8C is a partial enlarged view of a region R2 in Fig. 8B;

Fig. 8D is a partial side view of Fig. 8A; and

Fig. 8E is a cross-sectional view along a line B-B of Fig. 8D.

#### DESCRIPTION OF THE REFERENCE NUMBERS IN THE FIGURES

1~ first case

10~ first wall

100~ end surface

101~ bottom surface

10S1、10S2~ first outer wall, first inner wall

11~ first connecting portions

12~ first thrust portion

121、122~ end portions

121E、122E~ end portion

I、II、III、IV~ surface

I-I、III-III~ line

2~ second case

2'~ second case

20~ second wall

20'~ second wall

20'-1~ main panel

20'-2、20-3'~ wing panel  
20'S1、20'S2~ second outer wall, second inner wall  
200'~ end surface  
20-1~ main panel  
5 20-2~ wing panel  
20S1、20S2~ second outer wall, second inner wall  
21~ second connecting portions  
21'~ second connecting portions  
210~ positioning plate  
10 22~ second thrust portion  
22'~ second thrust portion  
50~ notches  
A-A、B-B~ line  
B、B1、B2、B3~ housing structure  
15 C-1~ positioning protrusion  
C-2~ positioning plate  
C-3~ positioning hole  
E~ object  
F、F'~ force  
20 h、h'~ length  
H1~ lower case  
H2~ upper case  
IS~ inner space  
J、J1、J2、J3~ joint region  
25 K~ non-uniform appearance  
L1、L2~ joint region  
M11、M12~ flat portion  
M21、M22~ step portion  
M31、M32~ step portion  
30 OS~ outer space

P1~ housing structure

P2~ housing structure

R1、R2~ area

T1、T2~ surface

5 W1-1、W1-2~ side wall

W2-2、W2-2~ side wall

W3-2、W3-2~ side wall

X-Y、Y-Y、Z-Z~ line

**What is claimed is:**

1           1. A housing structure having an inner space,  
2 comprising:

3           a first case including a first wall, at least one  
4           first connecting portion and at least one first  
5           thrust portion, the first wall including a  
6           first inner wall facing the inner space ; and

7           a second case connected with the first case  
8           including a second wall, at least one second  
9           connecting portion and at least one second  
10          thrust portion, the second wall including a  
11          second inner wall facing the inner space, and  
12          the first connecting portion connecting with  
13          the second connecting portion in a detachable  
14          manner;

15          characterized in that the second thrust portion is  
16          disposed in the second wall, facing the first  
17          case, and when the first connecting portion  
18          connects with the second connection portion,  
19          the second thrust portion is adjacent to the  
20          first inner wall, corresponding to the first  
21          thrust portion.

1           2. The housing structure as claimed in claim 1,  
2 wherein the second thrust portion extends and protrudes  
3 from the second inner wall.

1           3. The housing structure as claimed in claim 1,  
2 wherein the first connecting portion and the first thrust  
3 portion are integrally formed on the first inner wall.

1           4. The housing structure as claimed in claim 1,  
2 wherein the second connecting portion and the second  
3 thrust portion are integrally formed on the second inner  
4 wall.

1           5. The housing structure as claimed in claim 1,  
2 wherein the first thrust portion is formed by at least  
3 one protrusion.

1           6. The housing structure as claimed in claim 1,  
2 wherein the second thrust portion is formed by protruding  
3 out of the second wall.

1           7. The housing structure as claimed in claim 1,  
2 wherein the first case is substantially provided with a  
3 uniform cross section.

1           8. The housing structure as claimed in claim 1,  
2 wherein the second case is substantially provided with a  
3 uniform cross section.

1           9. The housing structure as claimed in claim 1,  
2 wherein the first connecting portion is a positioning  
3 protrusion, and the second connecting portion is a  
4 positioning hole.

1           10. A housing structure comprising:

2 a first case including a first wall, at least one  
3 first connecting portion and at least one first  
4 thrust portion; and

5 a second case connected with the first case  
6 including a second wall, at least one second  
7 connecting portion, and at least one second  
8 thrust portion, wherein the second wall  
9 substantially has an L-shaped section,  
10 connected with the first thrust portion, the  
11 second connecting portion is joined with the  
12 first connecting portion in a detachable  
13 manner, and the second thrust portion is  
14 connected with the first wall.

1 11. The housing structure as claimed in claim 10,  
2 wherein the first connecting portion and the first thrust  
3 portion are integrally formed on the first wall.

1 12. The housing structure as claimed in claim 10,  
2 wherein the second connecting portion and the second  
3 thrust portion are integrally formed on the second wall.

1 13. The housing structure as claimed in claim 10,  
2 wherein the first thrust portion is formed by at least  
3 one protrusion.

1 14. The housing structure as claimed in claim 10,  
2 wherein the second thrust portion is formed by protruding  
3 out of the second wall.

1 15. The housing structure as claimed in claim 10,  
2 wherein the first case is substantially provided with a  
3 uniform cross section.

1 16. The housing structure as claimed in claim 10,  
2 wherein the second case is substantially provided with a  
3 uniform cross section.

1 17. The housing structure as claimed in claim 10,  
2 wherein the first connecting portion is a positioning  
3 protrusion, and the second connecting portion is a  
4 positioning hole.

1 18. The housing structure as claimed in claim 10,  
2 wherein the second wall includes a main plate and a wing  
3 plate, wherein the main plate is substantially provided  
4 with a uniform cross section, and the wing plate is  
5 substantially provided with a uniform cross section.

1 19. A housing structure, comprising:

2 a first case, a first inner wall of the first case  
3 having at least one first connecting portion ,  
4 and at least one first thrust portion, each of  
5 the first thrust portion having a notch;

6 a second case, a second inner wall of the second  
7 case having at least one second connecting  
8 portion and at least one second thrust portion;

9 characterized in that the second thrust portion is  
10 in the notch when the first case connects with  
11 the second case.

1 20. A housing structure, consisting of:



2 a first case having a first inner wall, the first  
3 inner wall having a extension plate with a  
4 length of h;

5 a second case having a second inner wall, the second  
6 inner wall having at least one rib having a  
7 notch with a length of h at where the rib  
8 connects with the second inner wall;

9 wherein the extension plate is in the notch when the  
10 first case connects with the second case.

1 21. The housing structure as claimed in claim 20,  
2 wherein the extension plate is extended from the end of  
3 the inner wall with a length of h.

1 22. The housing structure as claimed in claim 20,  
2 wherein the first case further includes a first  
3 connecting portion, the second case further includes a  
4 second connecting portion, and the first connecting  
5 portion connects with the second connecting portion in a  
6 detachable manner when the first case connects with the  
7 second case.

1 23. A housing structure, including:

2 a first case having a first inner wall with a Z-  
3 shaped surface, wherein the Z-shaped surface  
4 has an extension plate with a length of h; and

5 a second case having a second inner wall with at  
6 least one rib, wherein a notch with a depth of  
7 h is formed at where the rib connecting with  
8 the second inner wall;

9            wherein the extension plate engages with the notch

10           when the first case joins the second case: . . .

1            24. The housing structure as claimed in claim 23,  
2            wherein the first case further includes a first  
3            connecting portion, the second case further includes a  
4            second connecting portion, and the first connecting  
5            portion connects with the second connecting portion in a  
6            detachable manner when the first case connects with the  
7            second case.

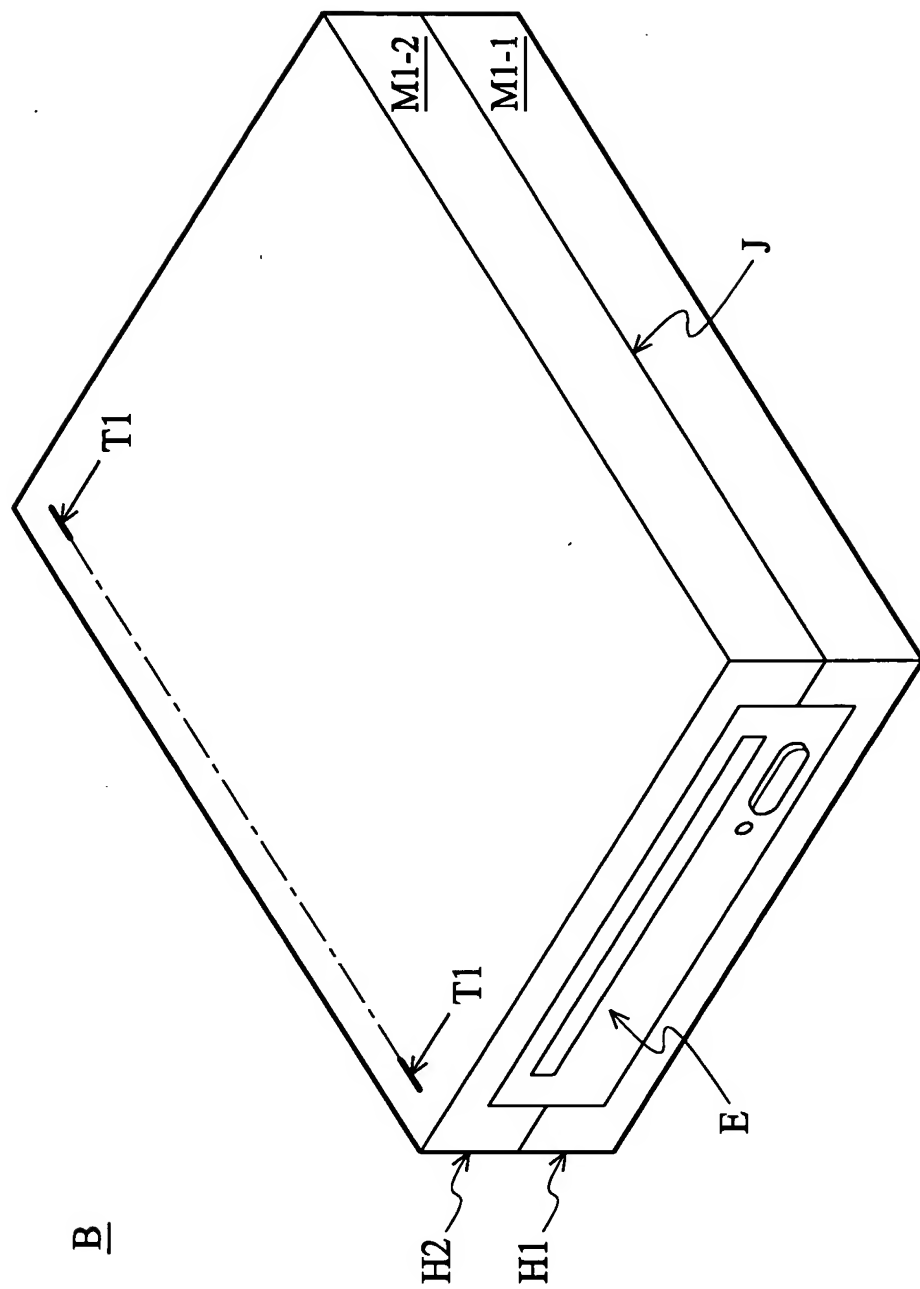


FIG. 1 (RELATED ART)

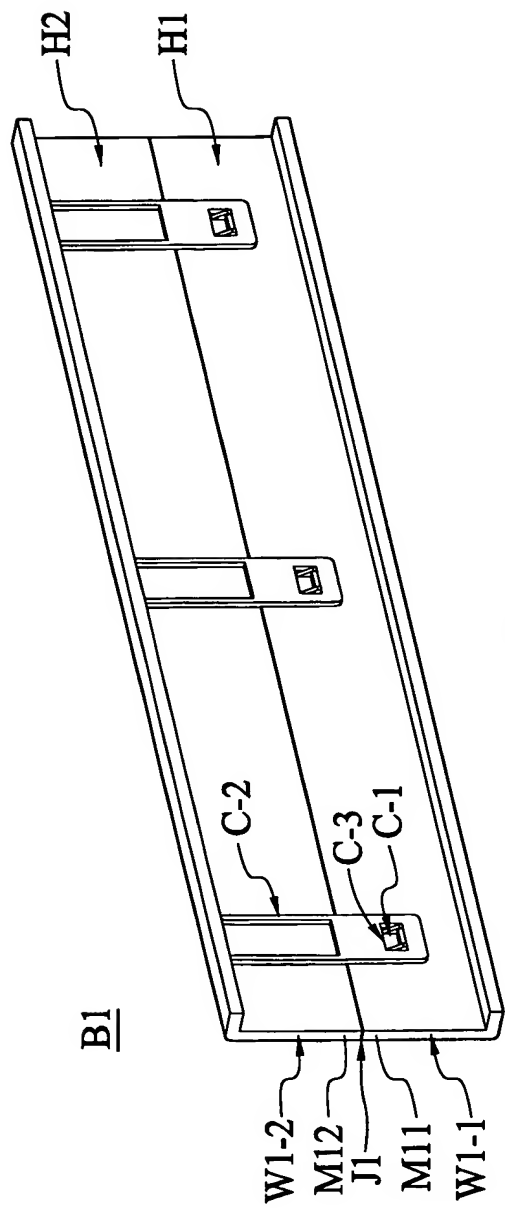


FIG. 2A (RELATED ART)

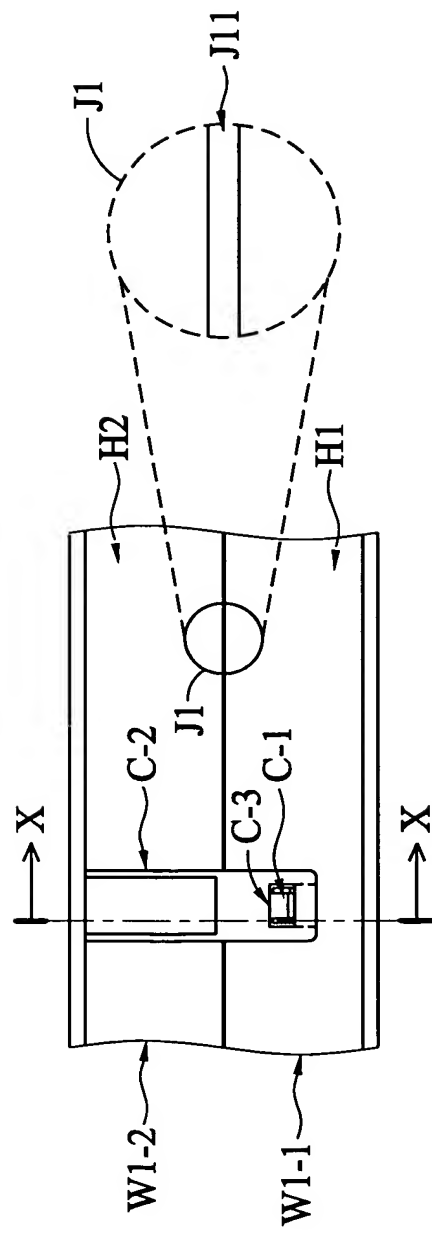


FIG. 2B (RELATED ART)

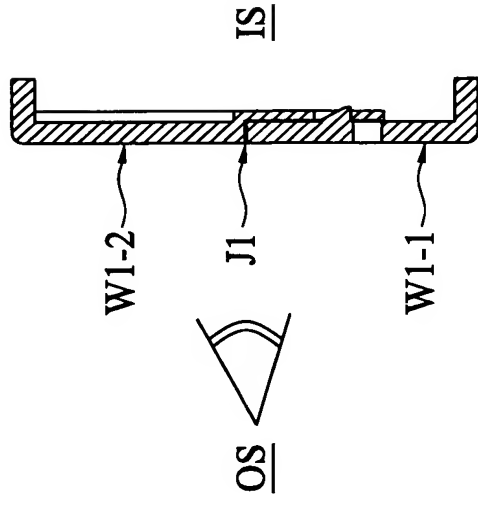


FIG. 2C (RELATED ART)

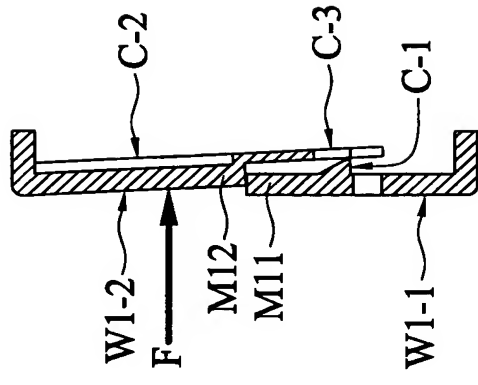


FIG. 2D (RELATED ART)

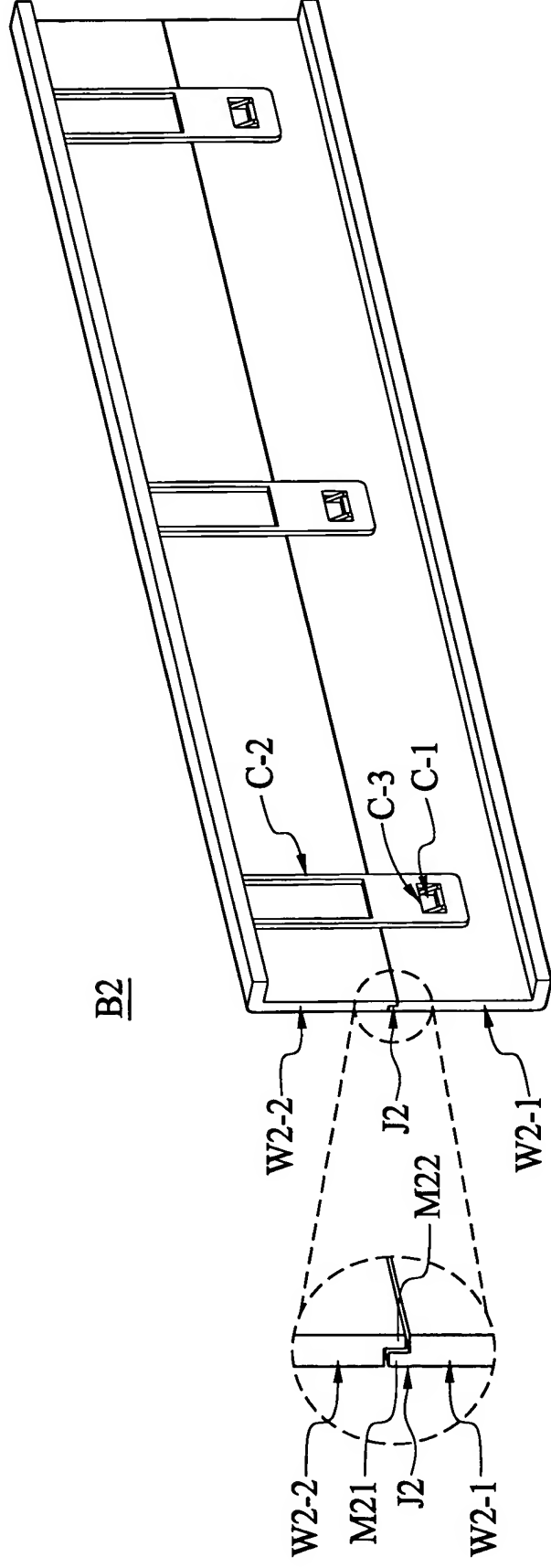


FIG. 3A (RELATED ART)

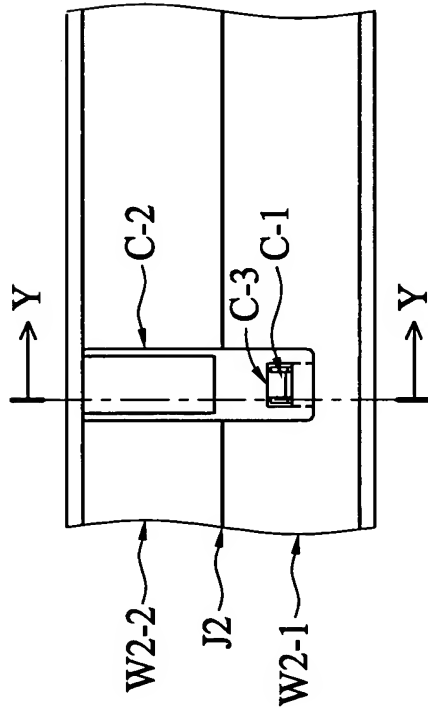


FIG. 3B (RELATED ART)

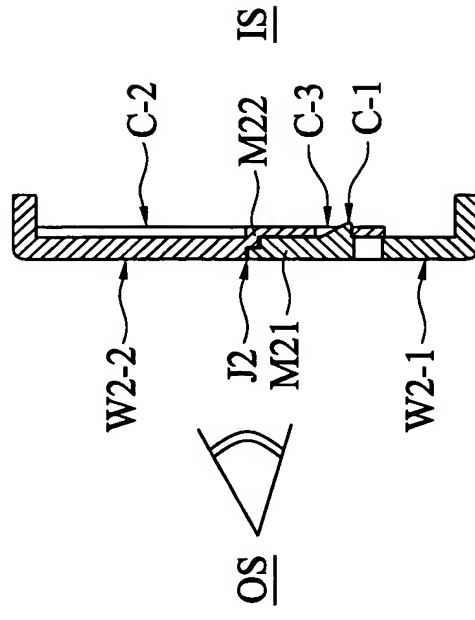


FIG. 3C (RELATED ART)

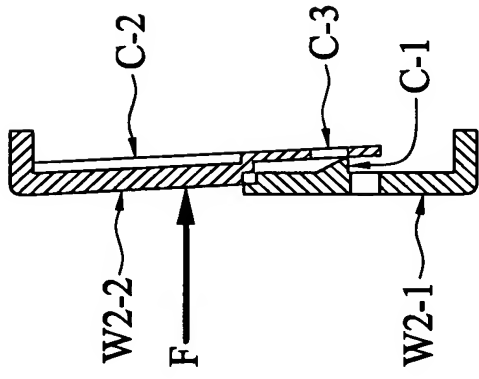


FIG. 3D (RELATED ART)

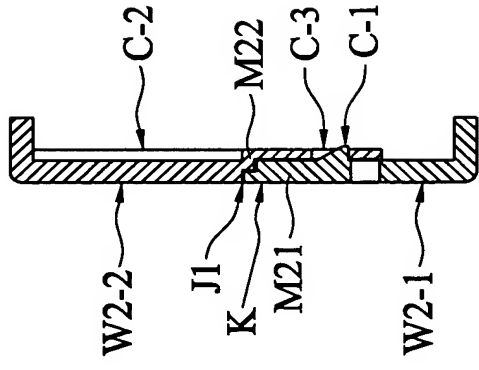


FIG. 3E (RELATED ART)

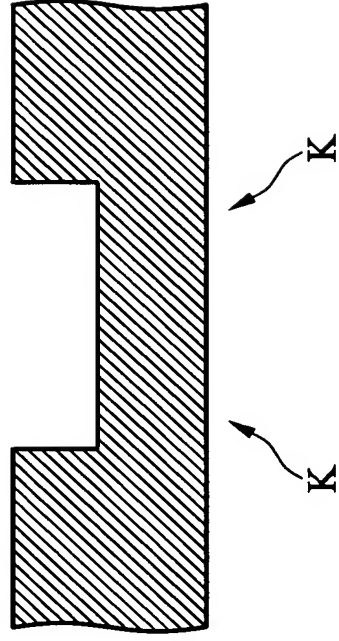


FIG. 3F (RELATED ART)



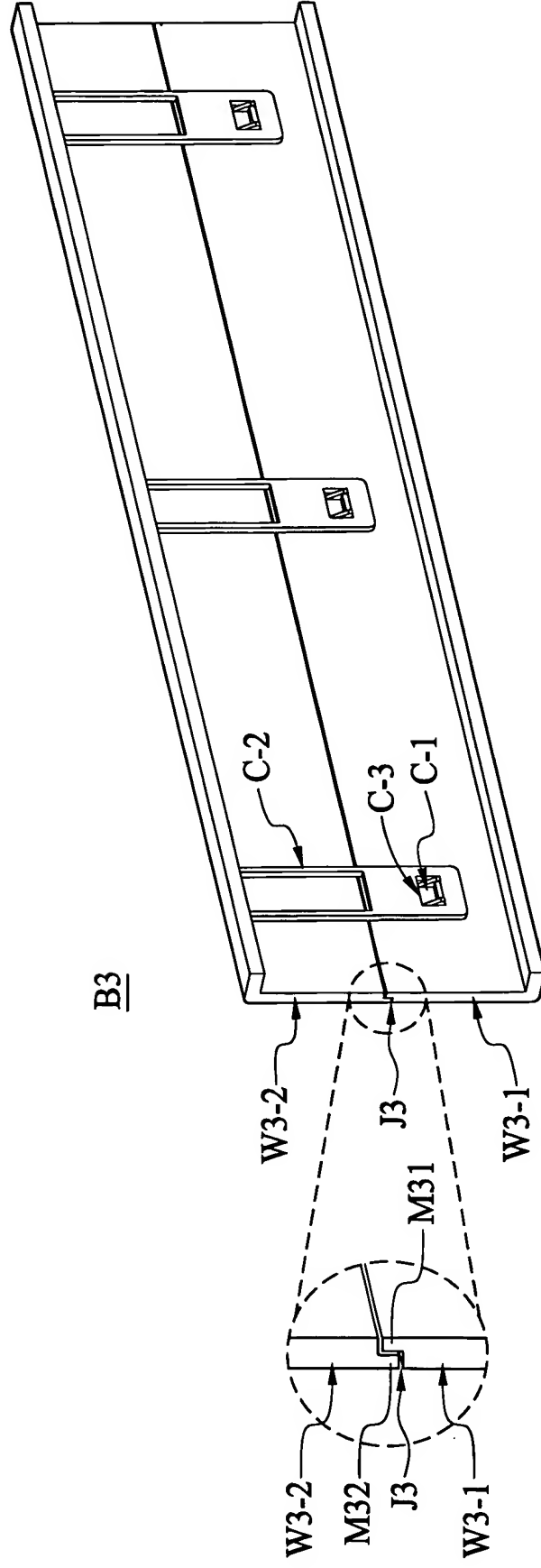


FIG. 4A (RELATED ART)

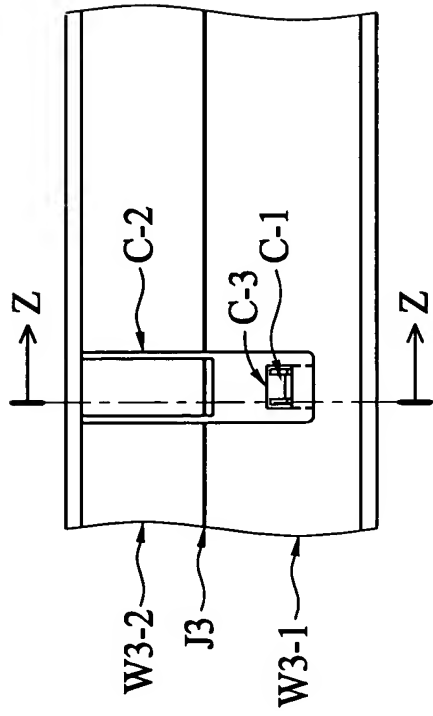


FIG. 4B (RELATED ART)

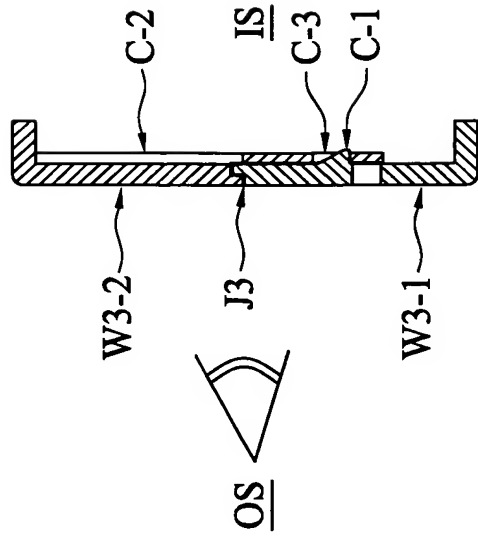


FIG. 4C (RELATED ART)

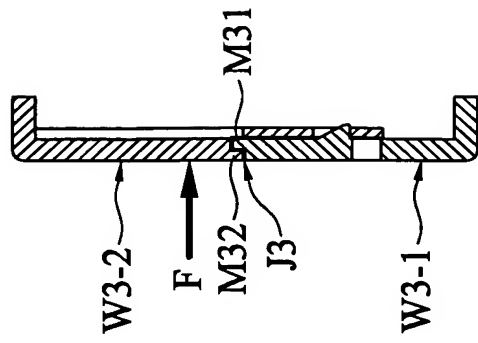


FIG. 4D (RELATED ART)

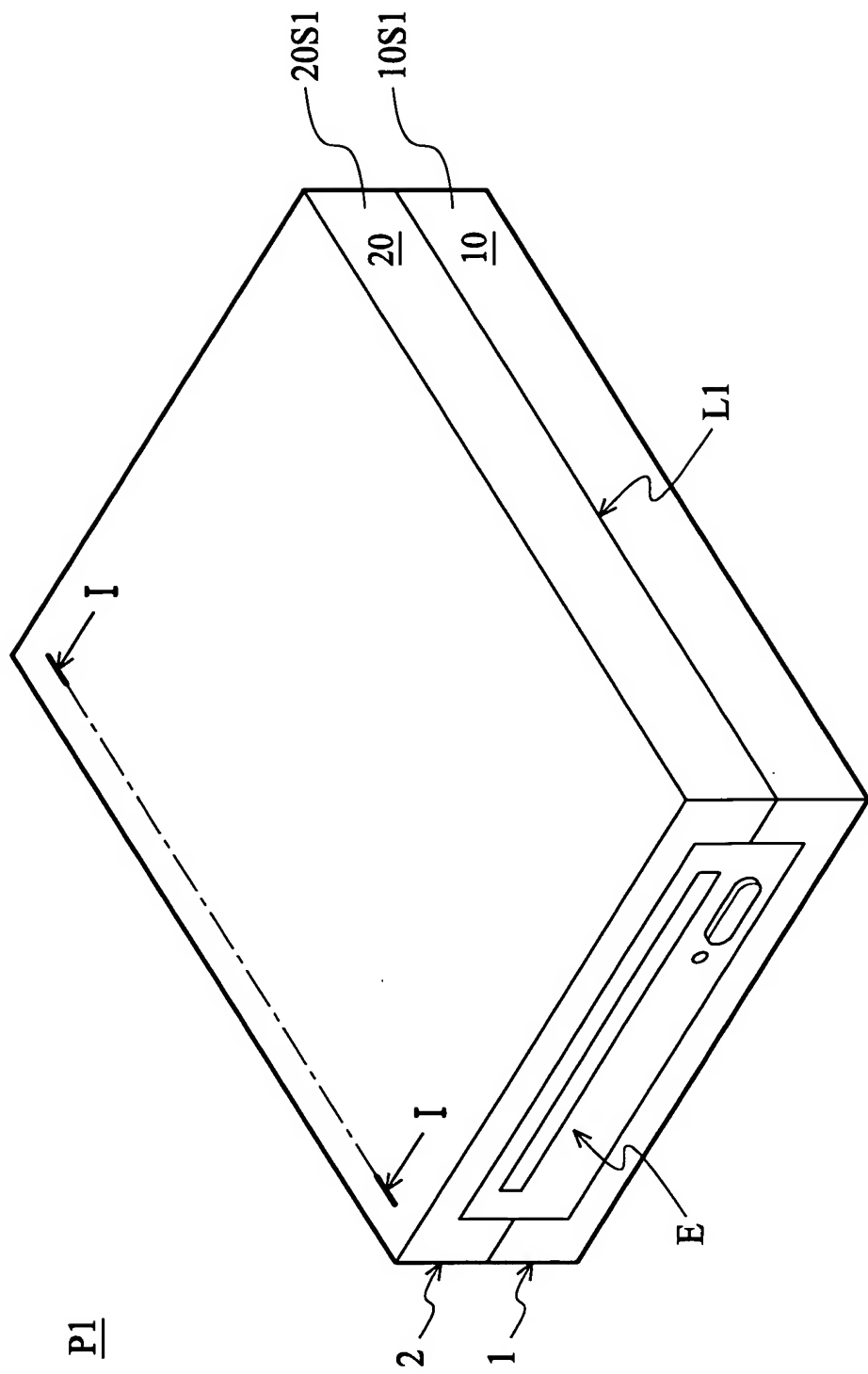
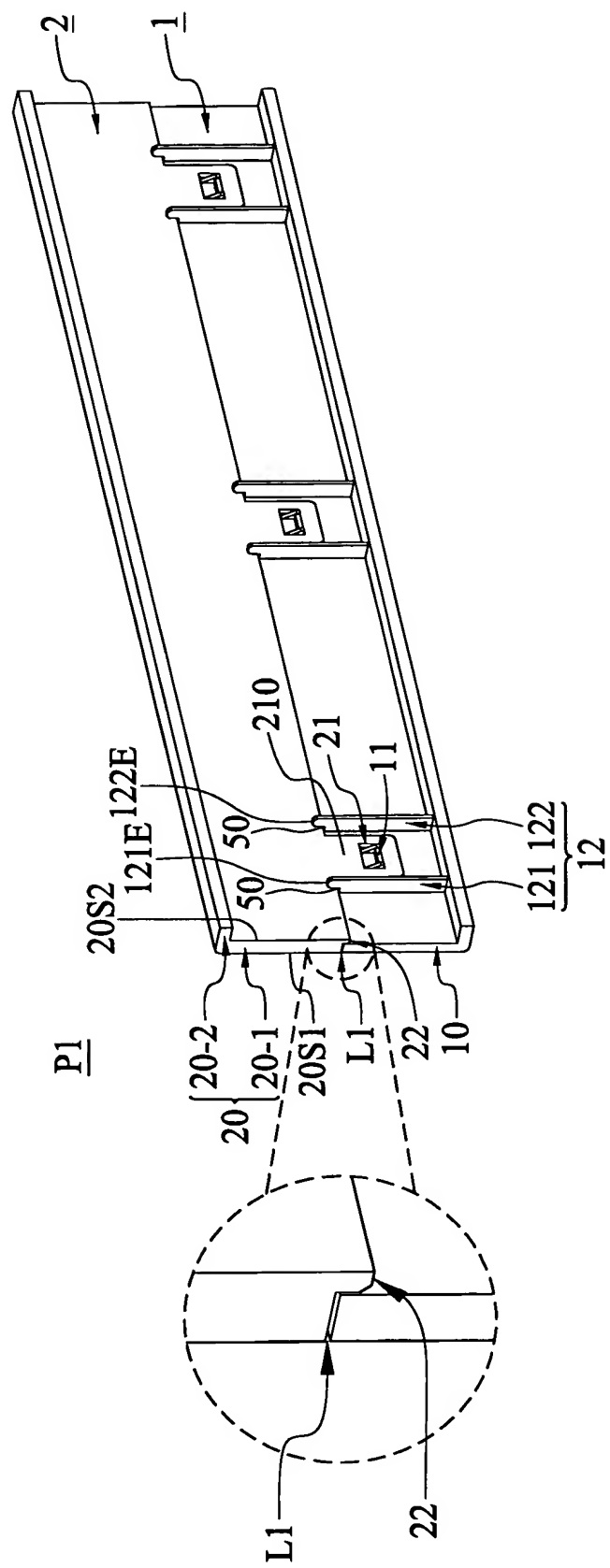


FIG. 5





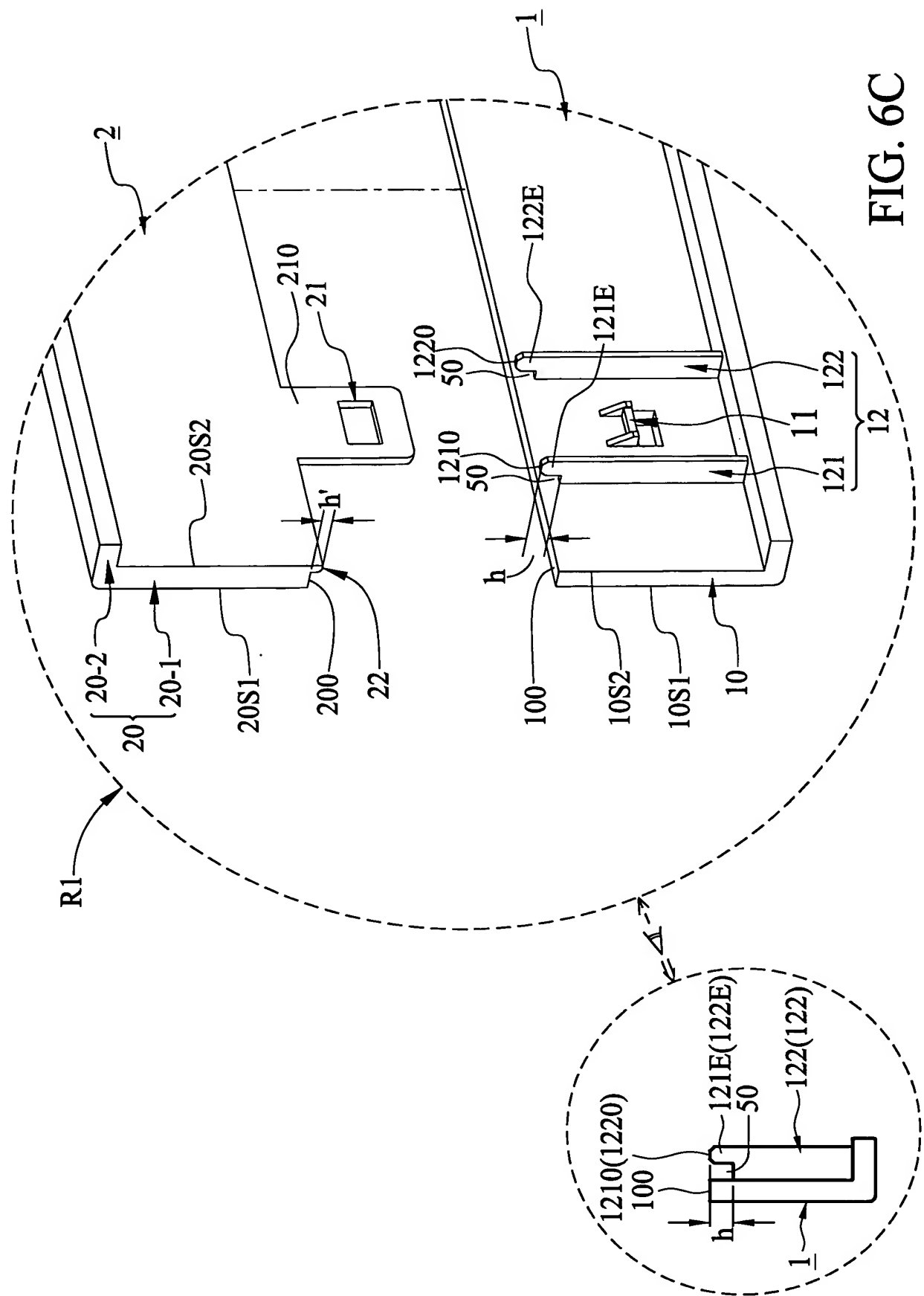


FIG. 6C

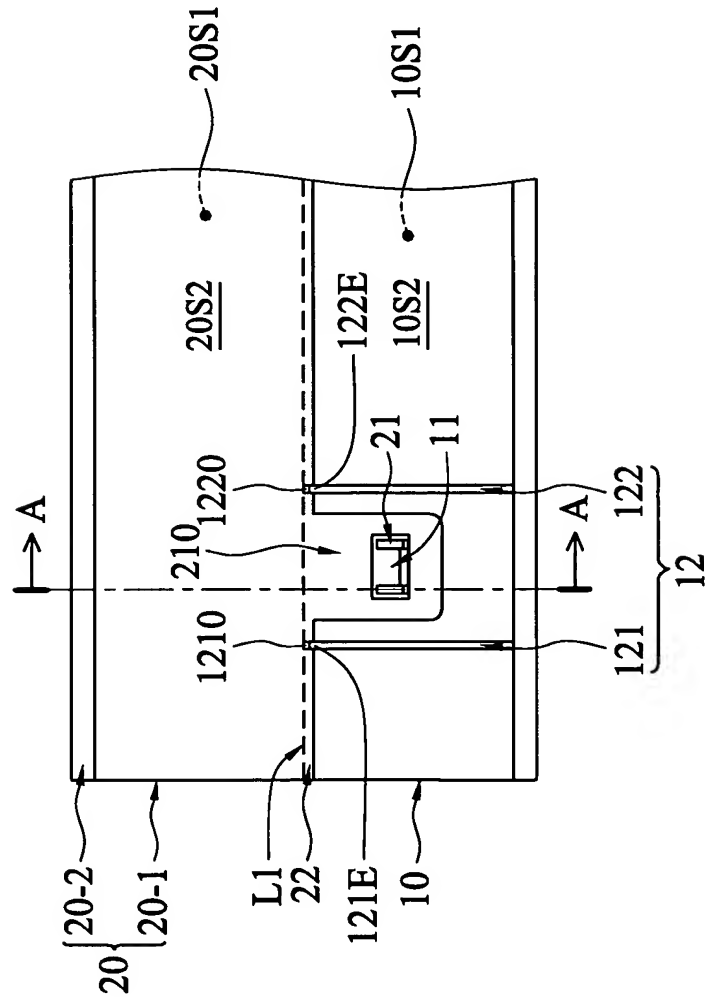


FIG. 6D

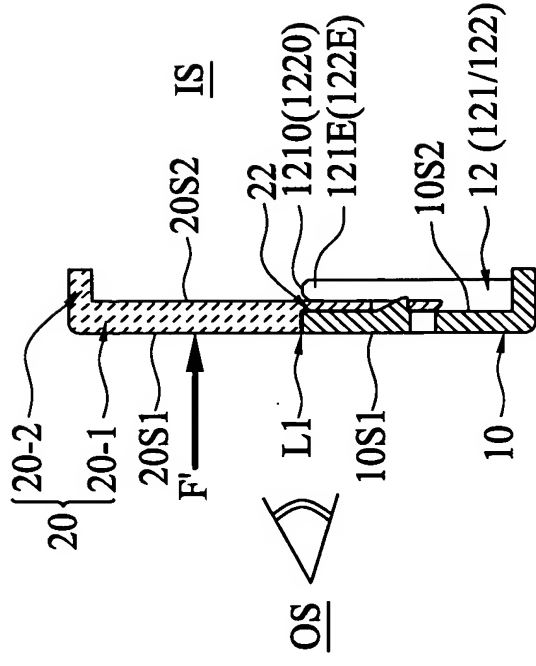


FIG. 6E

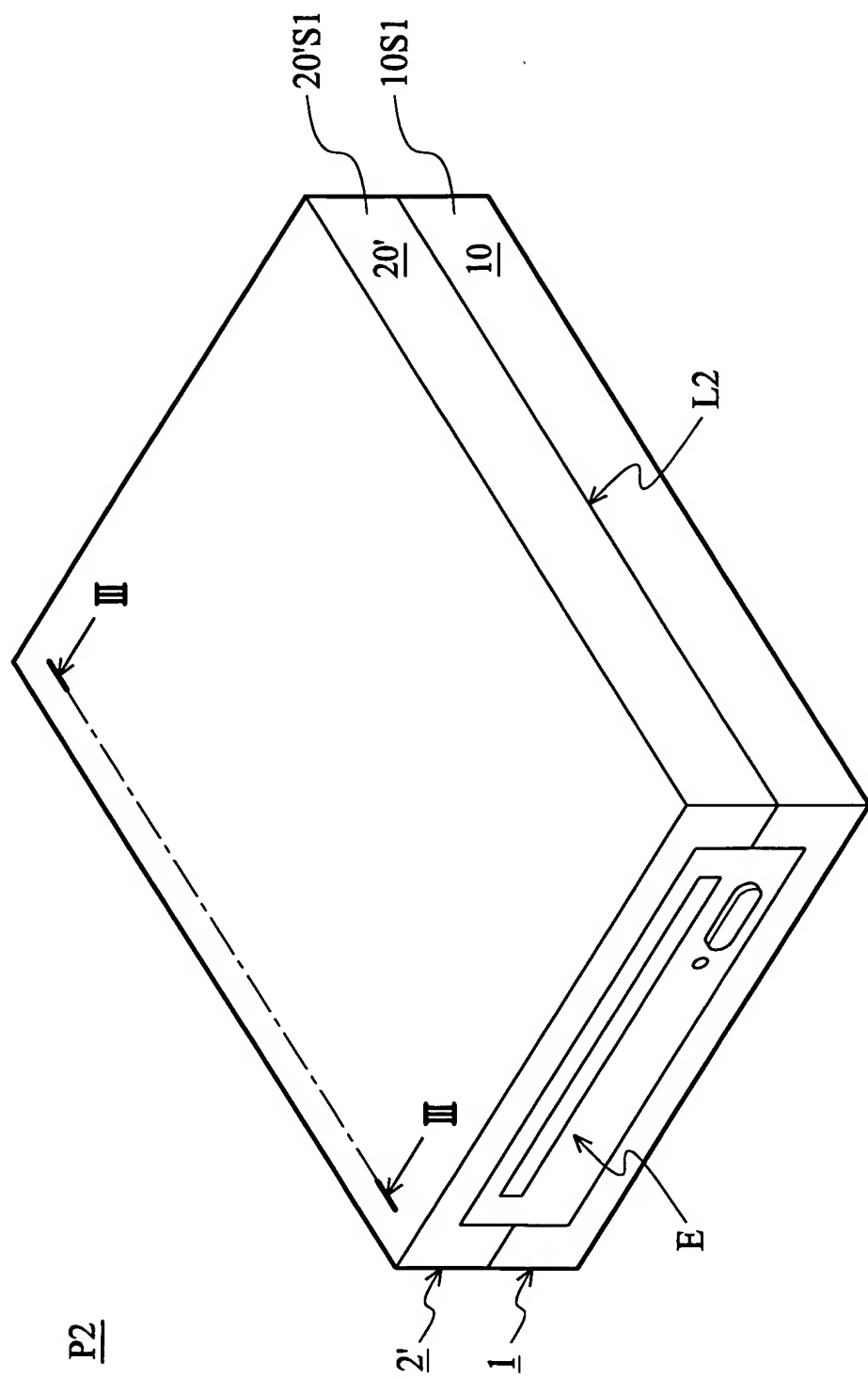


FIG. 7



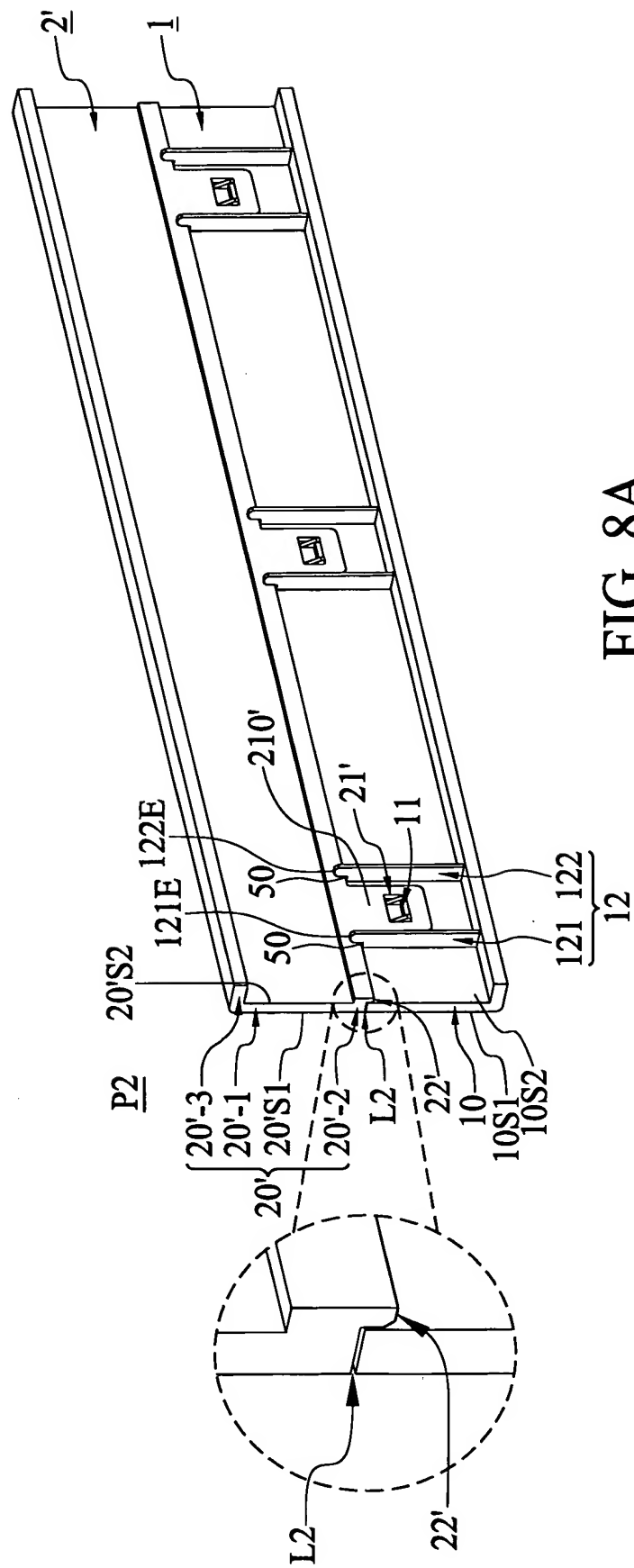


FIG. 8A

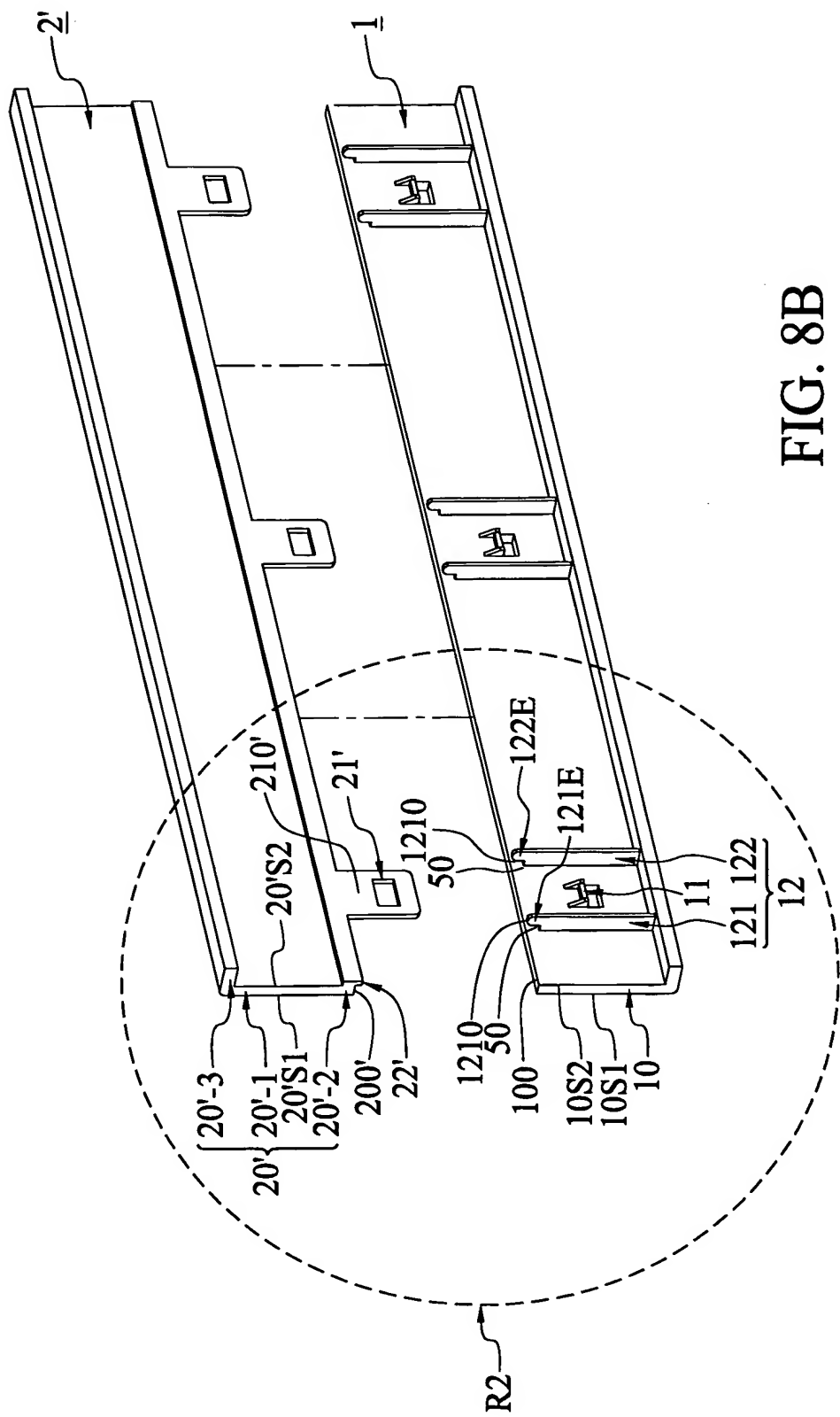


FIG. 8B

